

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



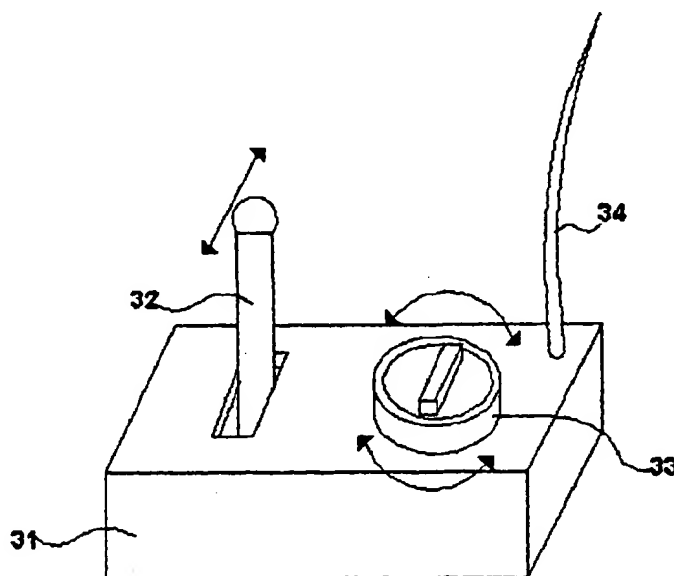
(43) International Publication Date
4 January 2001 (04.01.2001)

PCT

(10) International Publication Number
WO 01/00293 A1

- (51) International Patent Classification⁷: A63H 17/39 Kugal li, Kiheungup, Yongin City, Kyungki-do 449-900 (KR).
- (21) International Application Number: PCT/KR00/00650
- (22) International Filing Date: 22 June 2000 (22.06.2000)
- (25) Filing Language: Korean
- (26) Publication Language: English
- (30) Priority Data:
2000/24120 24 June 1999 (24.06.1999) KR
2000/32831 14 June 2000 (14.06.2000) KR
- (81) Designated States (*national*): AT, AU, BR, CA, CH, CN, DE, DK, EE, ES, FI, GB, HU, ID, IN, IS, JP, LT, LU, MX, NO, NZ, PL, SG, TR, US.
- (84) Designated States (*regional*): European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).
- Published:
— With international search report.
- (71) Applicant and
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- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: WIRELESS REMOTE CONTROLLER FOR TOY CAR



(57) Abstract: A remote controller for radio-controlled toy car which can control running direction of toy car with electronic circuit structure which can change the direction of wheel in different direction along forward and backward movement includes two switches, one of which is linear switch for the forward or backward movement controlling, the other of which is rotational switch for changing running direction in clockwise or counterclockwise movement. Linear switch has three common electrodes and three electrodes for forward movement and the other three electrodes for backward movement. Rotational switch includes a common electrode and an electrode for clockwise movement and the other electrode for counterclockwise movement.



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WIRELESS REMOTE CONTROLLER FOR TOY CAR

Technical Field

The presentation relates to a remote controller for radio controlled toy car.

5 Background Art

Fig.1 is a schematic view illustrative of a radio controlled toy car.

In general, remote controller consists of controller body(1), front side or backside movement controlling part(2) and right hand side or
10 left hand side movement controlling part(3).

Usually, front side or backside movement controlling part is made of stick(2) moving front or backside and right hand side or left hand side movement controlling part is made of stick(3) moving right or left side.

15 In the following description, the stick(2) moving front or backside is notified as front/back side controlling switch(2) and the stick(3) moving right or left side is described as right/left side controlling switch(3).

On the above constitution, the toy car will move front or back
20 depending on the front/back side controlling switch(2) controlling.

On the above description, the meaning of front side movement of toy car indicates the car is moving in the direction of front side of toy car. Backside movement is vise versa.

When we would like to change the direction of the toy car, we
5 can use right/left side controlling switch(3).

On the above description, in general the front wheel is rotating to move the car.

On the following description, left had turn means the front wheel turns in left hand side and right hand turn means the front
10 wheel turns in right hand side.

Fig. 2 is a schematic view of electronic wiring for each switch. There are the front/backside signal common electrode(5) attached on the front/back side controlling switch(2). Also there are front electrode(6a) and back electrode(6b).

15 In Fig 2, there are also direction turning common electrode(7) and left side electrode(8a) and right side electrode(8b).

Fig 3 is schematic view of controlling each switch.

According to Fig. 3a, when front/backside signal common electrode(5) is contacting front electrode(6a) and direction turning common
20 electrode(7) is contacting left side electrode(8a), then the toy car(15) will move in front side(11) and turn to left as the front wheel(16) will turn to left(17a) as indicated.

According to Fig. 3b, when front/backside signal common electrode(5) is contacting front electrode(6a) and direction turning common electrode(7) is contacting right side electrode(8b), then the toy car(15) will move in front side(11) and turn to right as the front
5 wheel(16) will turn to right(17b) as indicated.

According to Fig. 3c, when front/backside signal common electrode(5) is contacting front electrode(6a) and direction turning common electrode(7) is contacting right side electrode(8b), then the toy car(15) will move in front side(11) and turn to right as the front
10 wheel(16) will turn to left(17a) as indicated

According to Fig. 3d, when front/backside signal common electrode(5) is contacting back electrode(6b) and direction turning common electrode(7) is contacting right side electrode(8b), then the toy car(15) will move in back side(13) and turn to right as the front
15 wheel(16) will turn to right(17b) as indicated

The former description in Fig. 3 is indicating that the car is in front side when we see it with the controller(1).

But if the direction of toy car is different, the car is moving and turning in unexpected way.

20 For example, when the car is moving in different direction, the turning direction of toy car is depicted in fig.4.

According to Fig. 4a, when the toy car(15) is moving far from the controller(1), if

the direction turning common electrode(7) is contacting left side electrode(8a), the front wheel(16) of toy car(15) is turning to left(17a). So the toy will turn to left(22) in the same direction(12) of right/left side controlling switch(3).

5 According to Fig. 4b, when the toy car(15) is moving close to the controller(1), if the direction turning common electrode(7) is contacting left side electrode(8a), the front wheel(16) of toy car(15) is turning to left(17a). So the toy will turn to right(24) in the opposite direction(12) of right/left side controlling switch(3).

10 According to Fig. 4c, when the toy car(15) is moving right direction(25) to the controller(1), if the direction turning common electrode(7) is contacting left side electrode(8a), the front wheel(16) of toy car(15) is turning to left(17a). So the toy will turn to upside(24) in the different direction(12) of right/left side controlling switch(3).

15 According to Fig. 4d, when the toy car(15) is moving left direction(27) to the controller(1), if the direction turning common electrode(7) is contacting left side electrode(8a), the front wheel(16) of toy car(15) is turning to left(17a). So the toy will turn to downside(28) in the different direction(12) of right/left side controlling switch(3).

20 Fig. 4a, 4b, 4c, 4d indicate that the direction of the toy car is turning in different way as the controlling of switch of controller

Disclosure of Invention

The present invention provides the direction controllable wireless remote controller for toy car.

The switch for the controller is designed to rotate in clock or
5 counterclockwise direction.

In FIG. 5, there are controller which is comprised of controller body(31) and front side or backside movement controlling part(32) and clockwise or counterclockwise rotational controlling part(33) and antenna(34) for radio signal.

10 In the following description, the stick(32) moving front or backside is notified as front/back side controlling switch(32) and clockwise or counterclockwise rotational controlling part(33) is described as rotational controlling switch(33).

In Fig. 6, there are described the structure of direction controlling
15 electronic part. The electronic wiring consists of front/back side controlling part(35) and clockwise or counterclockwise rotational controlling part(37) and rotation-front/back side switch connection part(36).

In this invention, the front wheel of toy car will move in
20 opposite direction according to the controlling of rotational switch depending on that it is moving front side or backside.

Brief Description of Drawings

FIG. 1 is a schematic view illustrative of a appearance of conventional radio controlled toy car.

FIG. 2 is a schematic view illustrative of the electrode arrangement
5 of electrodes for wireless remote controller.

FIG. 3 is a schematic view illustrative of turning direction of front wheel depending on the control of switches of controller.

FIG. 4 is a schematic view illustrative of turning direction of toy car depending on the control of switches of controller.

10 FIG. 5 is a schematic view illustrative of the appearance of controller including linear switch and rotational switch.

FIG. 6 is a schematic view illustrative of direction control structural view.

FIG. 7 is a schematic view illustrative of electronic wiring of
15 linear switch and rotational switch.

FIG. 8 is a schematic view illustrative of the turning direction of front wheel depending on the rotation rotational switch.

FIG. 9 is a schematic view illustrative of turning direction of toy car.

20 FIG. 10 is a schematic view illustrative of electronic circuit design with additional rotation method selection switch.

FIG. 11 is a schematic view illustrative of appearance of controller with additional rotation method selection switch.

FIG. 12 is a schematic view illustrative of internal electronic circuit design of controller with linear switch and rotational switch in same position.

FIG. 13 is a schematic view illustrative of appearance of
5 controller with linear switch and rotational switch in same position.

Best Mode for Carrying Out the Invention

In FIG. 7, it is designed for electronic wiring of linear switch and rotational switch to realize front wheel control.

The present invention provides the coincidence of control of
10 rotational switch of controller and the real rotation direction of toy car.

The controller includes rotational switch(33) in FIG. 5. In this rotational switch, as shown in FIG. 7, there are attached rotational common electrode(71) which rotates with rotational
15 switch(33) in FIG. 5.

As shown in FIG. 7, in the controller, there are clockwise rotational signal switch(72b) which is fixed in the controller body(31) connecting physically and electronically with rotational common electrode(71) when this switch rotates clockwise direction,
20 and there are counterclockwise rotational signal switch(72a) which is fixed in the controller body(31) connecting physically and electronically with rotational common electrode(71) when this switch rotates counterclockwise direction.

The controller also includes linear switch(32) in FIG. 5 which has the function of controlling front and backside movement of toy car.

In this linear switch, as shown in FIG. 7, there are attached front/backside common electrode(62) which moves with linear
5 switch(32) in FIG. 5, and there are attached counterclockwise signal common electrode(64) which is connected electronically to clockwise rotational signal switch(72b), and there are attached clockwise signal common electrode(66) which is connected electronically to clockwise rotational signal switch(72a).

10 Also there are front side signal electrode(63a) which is contacting electronically to front/backside common electrode(62) when the linear switch moves frontward.

Also there are left rotation signal electrode for front wheel of toy car(65a) which is contacting to counterclockwise signal common
15 electrode(64) when the linear switch moves frontward.

Also there are right rotation signal electrode for front wheel of toy car(67a) which is contacting to clockwise signal common electrode(66) when the linear switch moves frontward.

Also there are back side signal electrode(63b) which is
20 contacting electronically to front/backside common electrode(62) when the linear switch moves backward.

Also there are right rotation signal electrode for front wheel

of toy car(65b) which is contacting to counterclockwise signal common electrode(64) when the linear switch moves backward.

Also there are left rotation signal electrode for front wheel of toy car(67b) which is contacting to clockwise signal common
5 electrode(66) when the linear switch moves backward.

The left rotation signal electrode for front wheel of toy car(65a) and the other left rotation signal electrode for front wheel of toy car(67b) is electronically connected to the left rotation signal generation electronic part for front wheel of toy car(76a).
10 The right rotation signal electrode for front wheel of toy car(65b) and the other rotation signal electrode for front wheel of toy car(67a) is electronically connected to the right rotation signal generation electronic part for front wheel of toy car(76b).

The left rotation signal generation electronic part for front
15 wheel of toy car(76a) is radio frequency wireless signal generation circuit to turn the front wheel(78) for toy car(15) to left(17a).

And the right rotation signal generation electronic part for front wheel of toy car(76b) is radio frequency wireless signal generation circuit to turn the front wheel(78) for toy car(15) to right(17b).

20 The left rotation signal generation electronic part for front wheel of toy car(76a) and the right rotation signal generation electronic part for front wheel of toy car(76b) is part of RF signal generation

circuit part to control the toy car.

As figured in FIG. 7, the linear switch(32) in FIG. 5 control front and backward movement.

When the linear switch is moved to front or backside with
5 rotating rotational switch(33), rotational common electrode(71) will be connected to the clockwise rotational signal switch(72b) or counterclockwise rotational signal switch(72a).

In the result, the front wheel of toy car will turn to left(17a) or right(17b) to turn the car clockwise or counterclockwise
10 direction.

In FIG. 8, it is described dependencies of controlling the switches of controller to the turning direction of toy car.

In FIG. 8a, there are figured the case that linear switch(32) is moved forward and the rotation switch is rotated
15 counterclockwise(83).

In this case, front/backside common electrode(62) will contact with front side signal electrode(63a) to move the car forward direction and the rotational common electrode(71) will contact with counterclockwise rotational signal switch(72a).

20 So the counterclockwise rotational signal switch(72a) is contacting with left rotation signal electrode for front wheel of toy car(65a) through the counterclockwise signal common electrode(64)

In the result, the left rotation signal generation electronic part for front wheel of toy car(76a) will turn on to turn the front wheels(78) to left(17a).

So the car will turn to counterclockwise(84).

5 In FIG. 8b, there are figured the case that linear switch(32) is moved forward and the rotation switch is rotated clockwise(86).

In this case, front/backside common electrode(62) will contact with front side signal electrode(63a) to move the car forward direction and the rotational common electrode(71) will contact with
10 clockwise rotational signal switch(72b).

As the clockwise rotational signal switch(72b) is contacting with right rotation signal electrode for front wheel of toy car(67a) through the clockwise signal common electrode(66)

In the result, the right rotation signal generation electronic
15 part for front wheel of toy car(76b) will turn on to turn the front wheels(78) to right(17b).

So the car will turn to counterclockwise(84).

In FIG. 8c, there are figured the case that linear switch(32) is moved backward and the rotation switch is rotated
20 counterclockwise(92).

In this case, front/backside common electrode(62) will contact with back side signal electrode(63b) to move the car backward

direction(91) and the rotational common electrode(71) will contact with counterclockwise rotational signal switch(72a).

So the counterclockwise rotational signal switch(72a) is contacting with the right rotation signal electrode for front wheel
5 of toy car(65b) through the counterclockwise signal common electrode(64)

In the result, the right rotation signal generation electronic part for front wheel of toy car(76b) will turn on to turn the front wheels(78) to right(17b).

10 So the car will turn to counterclockwise(92).

In FIG. 8d, there are figured the case that linear switch(32) is moved backward(91) and the rotation switch is rotated clockwise(93).

In this case, front/backside common electrode(62) will contact with back side signal electrode(63b) to move the car backward
15 direction(91) and the rotational common electrode(71) will contact with clockwise rotational signal switch(72b).

So the clockwise rotational signal switch(72b) is contacting with left rotation signal electrode for front wheel of toy car(65a) through the clockwise signal common electrode(66)

20 In the result, the left rotation signal generation electronic part for front wheel of toy car(76a) will turn on to turn the front wheels(78) to left(17a).

So the car will turn to clockwise(93).

In FIG. 9, the case of forward movement of toy car in different direction is figured.

It means that linear switch(32) is moved forward and front/backside
5 common electrode(62) will contact to front side signal electrode(63a)
and the rotation switch is turned to counterclockwise(83) to contact
the rotational common electrode(71) with counterclockwise rotational
signal switch(72a).

So the counterclockwise rotational signal switch(72a) is
10 contacting with the left rotation signal electrode for front wheel of
toy car(65a) through the counterclockwise signal common electrode(64)

In the result, the left rotation signal generation electronic part
for front wheel of toy car(76a) will turn on to turn the front
wheels(78) to right(17b).

15 The fixed bar(69) in FIG. 9 prevent for the rotation switch not to
rotate too much. The spring(68) in FIG. 9 turns back the rotation
switch after released.

In FIG. 9a, it is figured that the toy car(15) is moving far(21)
from the controller(31).

20 When the rotation switch is turned to counterclockwise(52), then
the front wheels(16) will turn to left(17a) so that toy car rotate to
counterclockwise(22) in the same way with rotation switch.

In FIG. 9b, it is figured that the toy car(15) is moving
close(23) from the controller(31).

When the rotation switch is turned to counterclockwise(53), then
the front wheels(16) will turn to left(17a) so that toy car rotate to
5 counterclockwise(24) in the same way with rotation switch.

In FIG. 9c, it is figured that the toy car(15) is moving right
side(25) from the controller(31).

When the rotation switch is turned to counterclockwise(54), then
the front wheels(16) will turn to left(17a) so that toy car rotate to
10 counterclockwise(26) in the same way with rotation switch.

In FIG. 9d, it is figured that the toy car(15) is moving left
side(27) from the controller(31).

When the rotation switch is turned to counterclockwise(55), then
the front wheels(16) will turn to left(17a) so that toy car rotate to
15 counterclockwise(28) in the same way with rotation switch.

In FIG. 10, there are circuit for rotation method selection
switch(91).

In general, the relative position between toy car and the person
who is controlling controller is changing every time.

20 So the person should control the toy car thinking as if he is in
the car.

In FIG. 10, the rotation method selection switch(91) is added to
the controller in FIG.7.

As figured in FIG. 10, the clockwise rotational signal switch(72b) and the counterclockwise rotational signal switch(72a) is connected to the common electrode 92a and 92b of rotation method selection switch(91).

5 The left rotation signal generation electronic part for front wheel of toy car(76a) and the right rotation signal generation electronic part for front wheel of toy car(76b) is contacting to common electrode 93a and 93b in each.

10 The counterclockwise signal common electrode(64) and the clockwise signal common electrode(66) is contacting with switches 94a and 94b in each.

And the other electrode 94a and 94b are contacting the common electrode 92a and 92b of the rotation method selection switch(91) when the switch rotates..

15 Also the electrode 94a and 94b are directly contacted to the right rotation signal electrode for front wheel of toy car(65b, 67a) and the left rotation signal electrode for front wheel of toy car(65a, 67b) in each.

20 In FIG. 11, it is figured the body of wireless remote controller. In this structure, the rotation method selection switch is added.

Using this switch, the operator can choose the rotation method in his preference.

In FIG. 12, there are the structure of using the linear switch

and rotation switch for changing direction for the user's preference.

In FIG. 12, there are added direction changing linear switch which will be connected to the left rotation signal generation electronic part for front wheel of toy car(76a) or the right rotation
5 signal generation electronic part for front wheel of toy car(76b).

In FIG. 13, there is the controller in which direction changing linear switch(124) is added in addition direction changing rotation switch.

Claims

1. A wireless remote controller for toy car to control the forward/backward movement and direction changing, the controller comprising : The electronic wiring consists of front/back side
5 controlling part(35) and clockwise or counterclockwise rotational controlling part(37) and rotation-front/back side switch connection part(36) and RF signal generation part.
2. The RF signal generation part of Claim 1 is comprising the left rotation signal generation electronic part for front wheel of toy car(76a) and
10 the right rotation signal generation electronic part for front wheel of toy car(76b)
3. The mechanism of controller as claimed in claim 2, there are attached front/backside common electrode(62) which moves with linear switch(32) and there are attached counterclockwise signal common
15 electrode(64) which is connected electronically to clockwise rotational signal switch(72b), and there are attached clockwise signal common electrode(66) which is connected electronically to clockwise rotational signal switch(72a) and there are front side signal electrode(63a) which is contacting electronically to
20 front/backside common electrode(62) when the linear switch moves frontward and there are left rotation signal electrode for front wheel of toy car(65a) which is contacting to counterclockwise signal common electrode(64) when the linear switch moves frontward and there

are right rotation signal electrode for front wheel of toy car(67a) which is contacting to clockwise signal common electrode(66) when the linear switch moves frontward and there are back side signal electrode(63b) which is contacting electronically to front/backside
5 common electrode(62) when the linear switch moves backward and there are right rotation signal electrode for front wheel of toy car(65b) which is contacting to counterclockwise signal common electrode(64) when the linear switch moves backward and there are left rotation signal electrode for front wheel of toy car(67b) which is contacting
10 to clockwise signal common electrode(66) when the linear switch moves backward.

4. The mechanism of controller as claimed in claim 3, when the rotational controlling part(33) rotates counterclockwise, rotational common electrode(71) will contact with counterclockwise rotational
15 signal switch(72a), when the rotational controlling part(33) rotates clockwise, rotational common electrode(71) will contact with clockwise rotational signal switch(72b).

5. The controller as claimed in claim 1 added with the rotation method selection switch(91).

20 6. A mechanism of controller as claimed in claim 5, the clockwise rotational signal switch(72b) and the counterclockwise rotational signal switch(72a) is connected to the common electrode 92a and 92b of

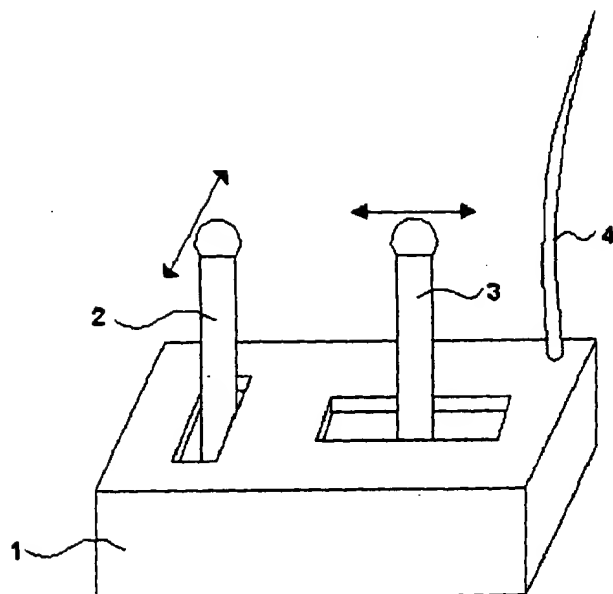
rotation method selection switch(91), and the left rotation signal generation electronic part for front wheel of toy car(76a) and the right rotation signal generation electronic part for front wheel of toy car(76b) is contacting to common electrode 93a and 93b in each, and the counterclockwise signal common electrode(64) and the clockwise signal common electrode(66) is contacting with switches 94a and 94b in each, and the other electrode 94a and 94b are contacting the common electrode 92a and 92b of the rotation method selection switch(91) when the switch rotates, and also the electrode 94a and 94b are directly contacted to the right rotation signal electrode for front wheel of toy car(65b, 67a) and the left rotation signal electrode for front wheel of toy car(65a, 67b) in each

7. The controller as claimed in claim 1, direction changing linear switch(124) is added in addition direction changing rotation switch in controller.

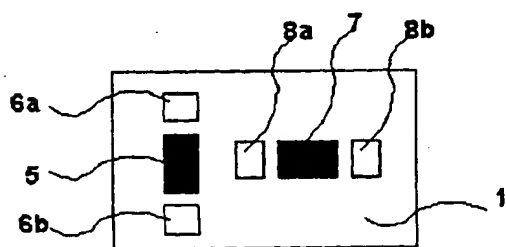
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[FIGURE]

【FIG. 1】

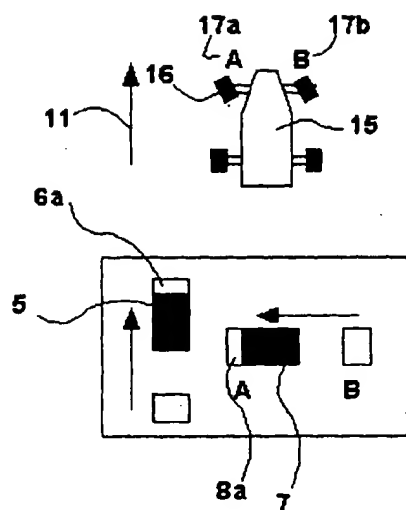


【FIG. 2】

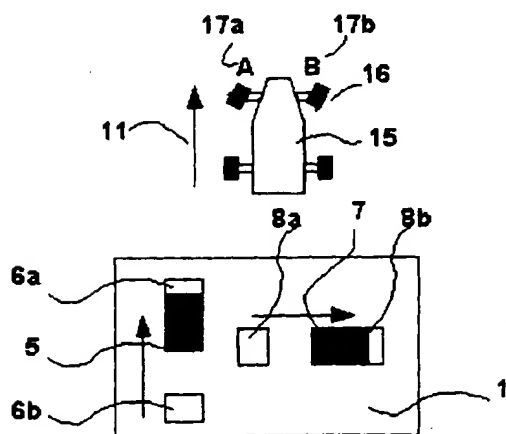


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【FIG. 3a】

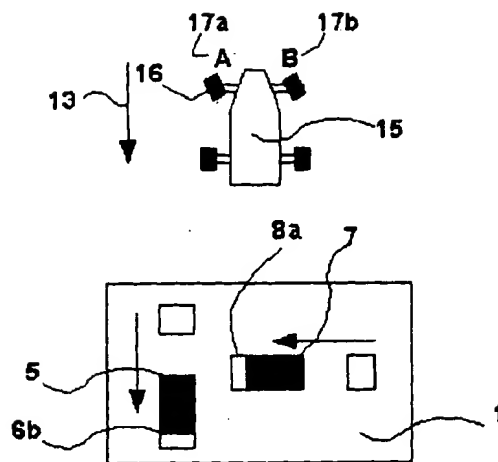


【FIG. 3b】

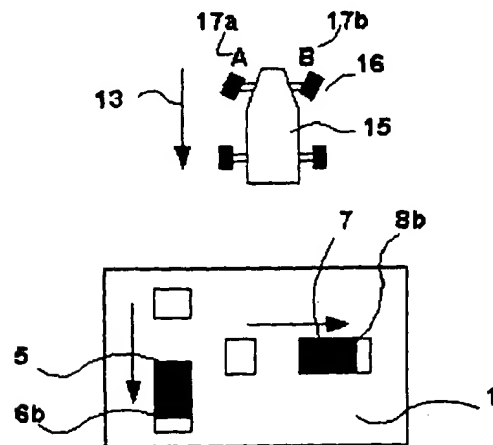


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【 FIG. 3c】

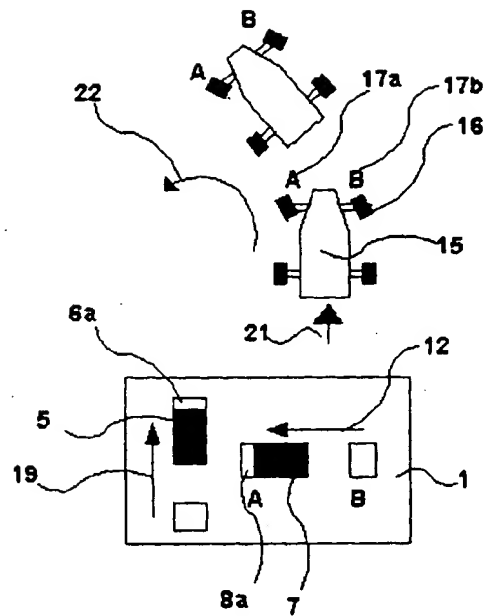


【 FIG. 3d】

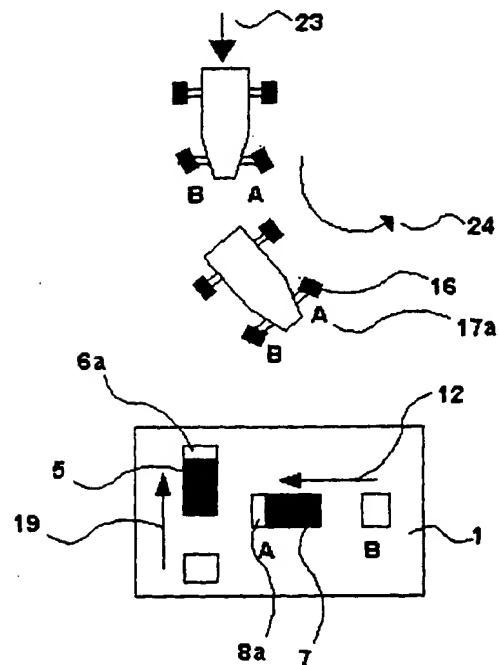


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【 FIG. 4a】

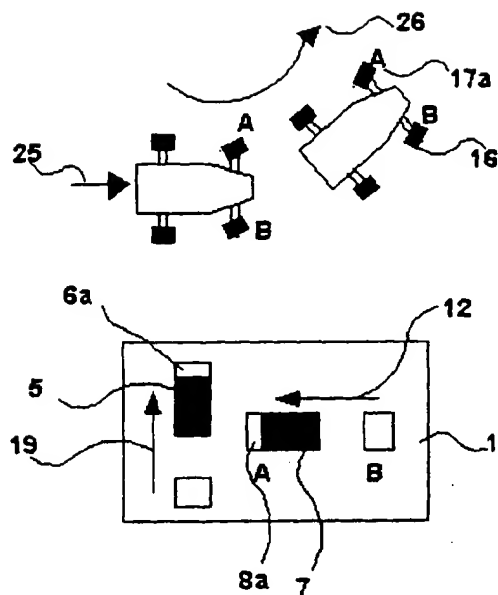


【 FIG. 4b】

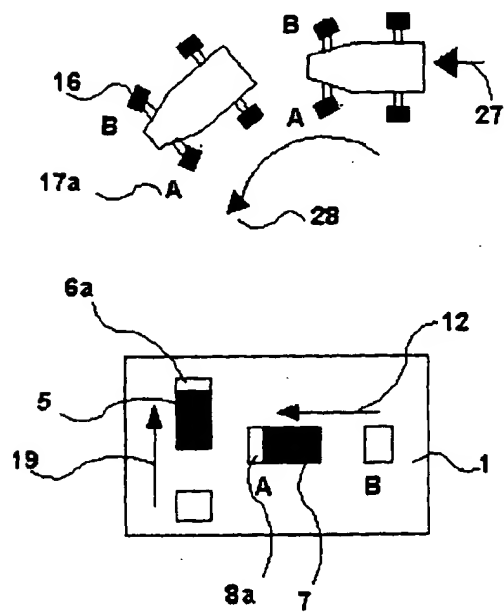


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【 FIG. 4c】

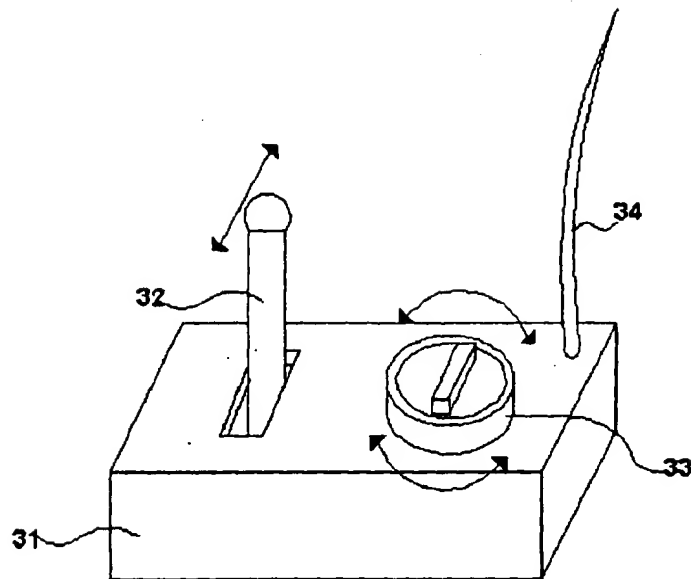


【 FIG. 4d】

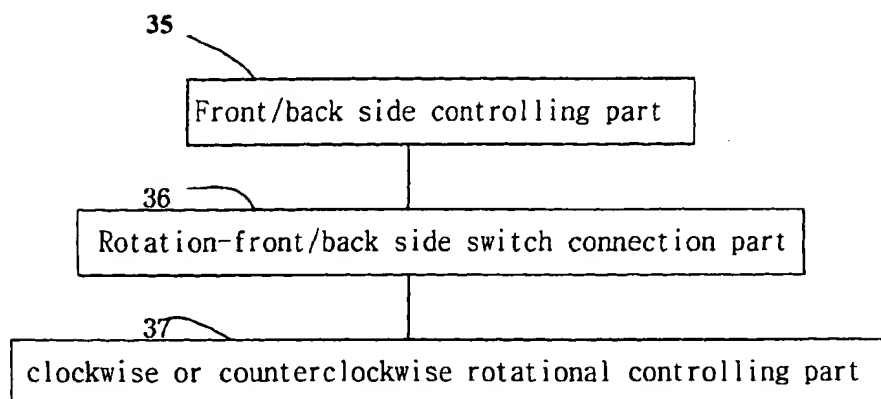


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【 FIG. 5】

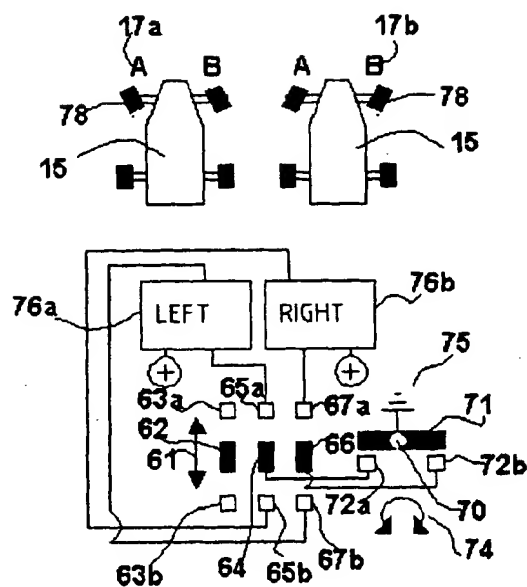


【 FIG. 6】

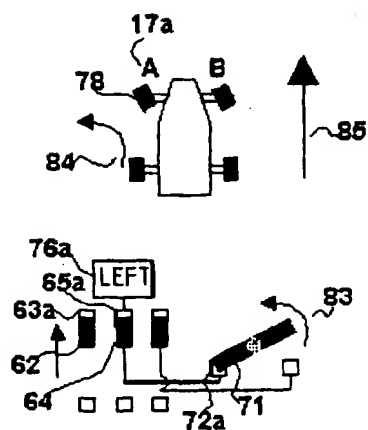


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【 FIG. 7】

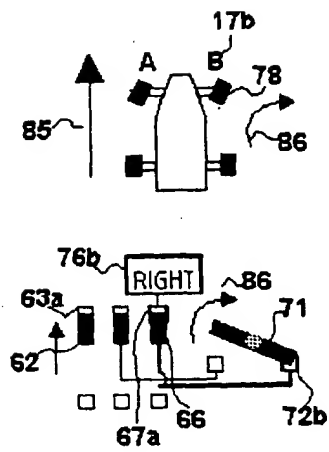


【 FIG. 8a】

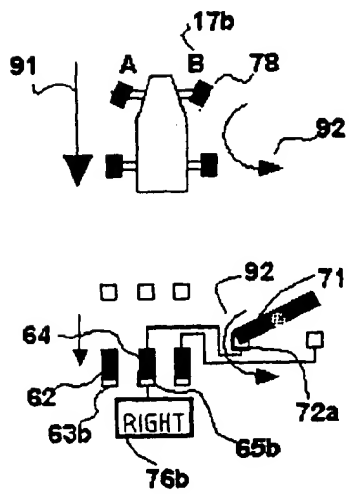


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【 FIG. 8b】

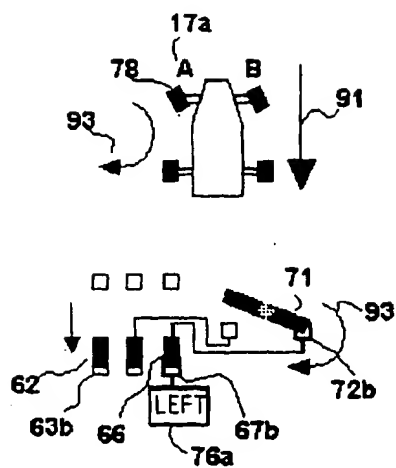


【도 8c】

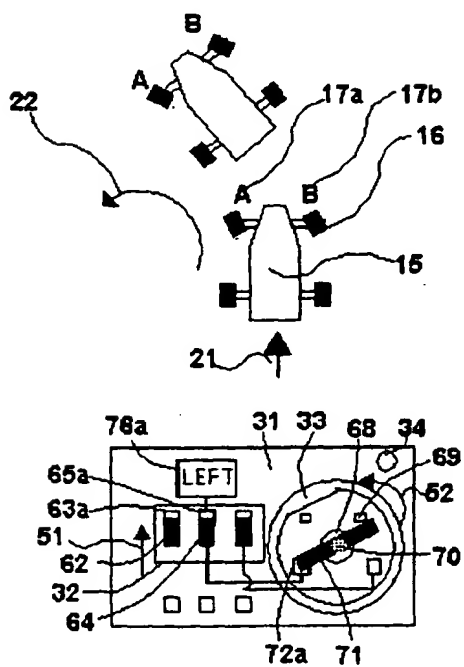


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【 FIG. 8d】

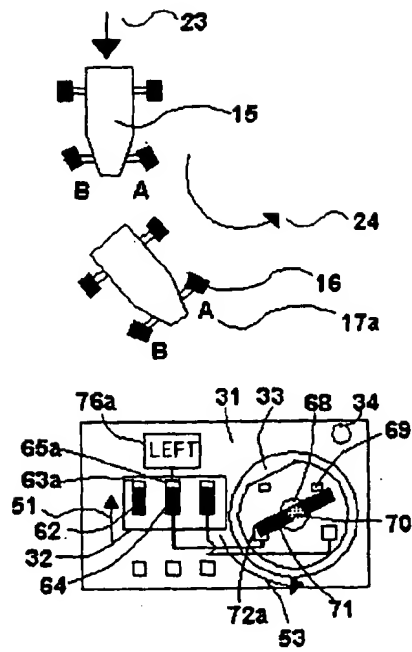


【 FIG. 9a】

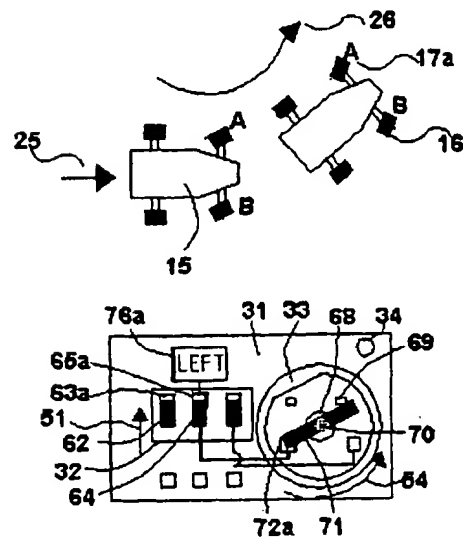


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【도 9b】

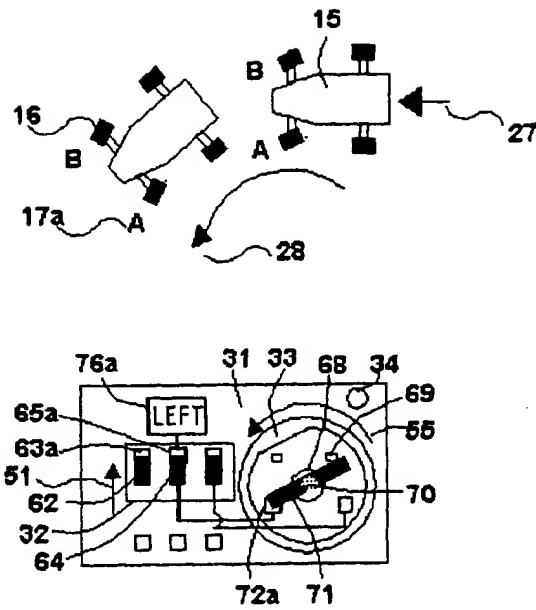


【 FIG. 9c】

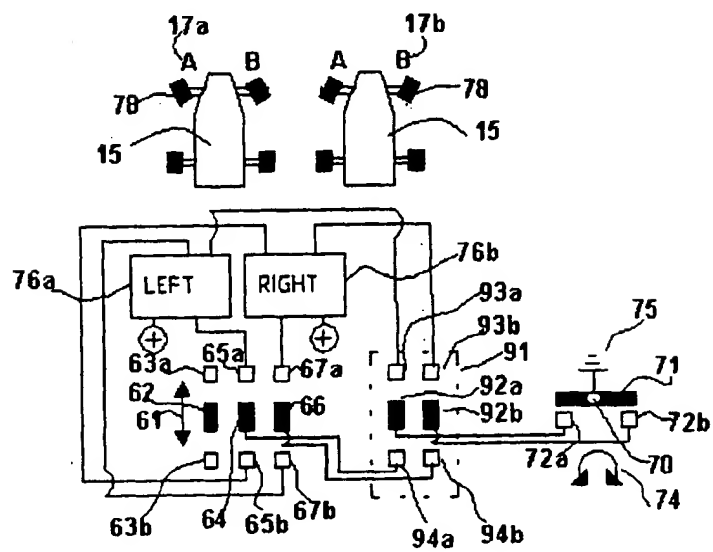


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[FIG. 9d]

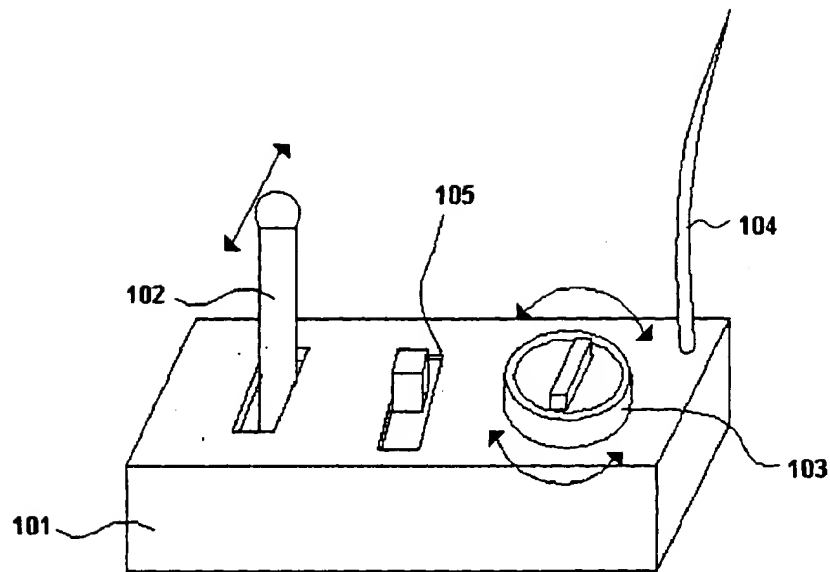


[FIG. 10]

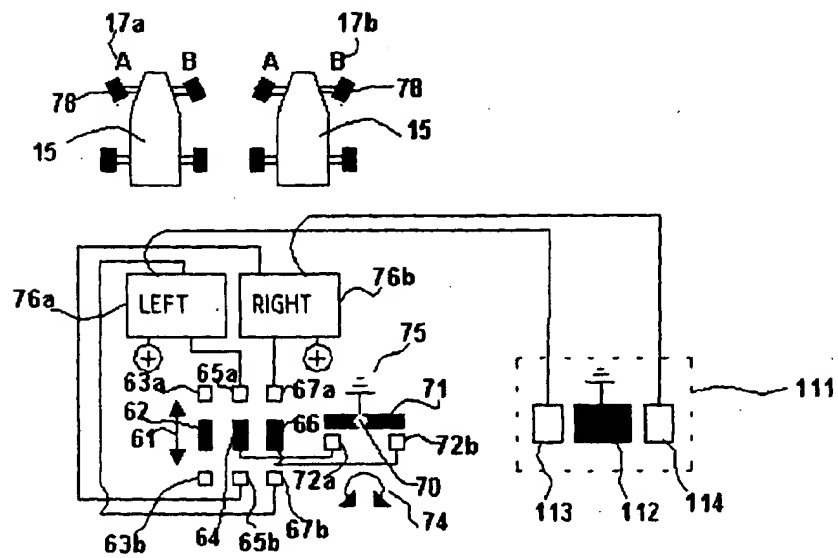


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【 FIG. 11】

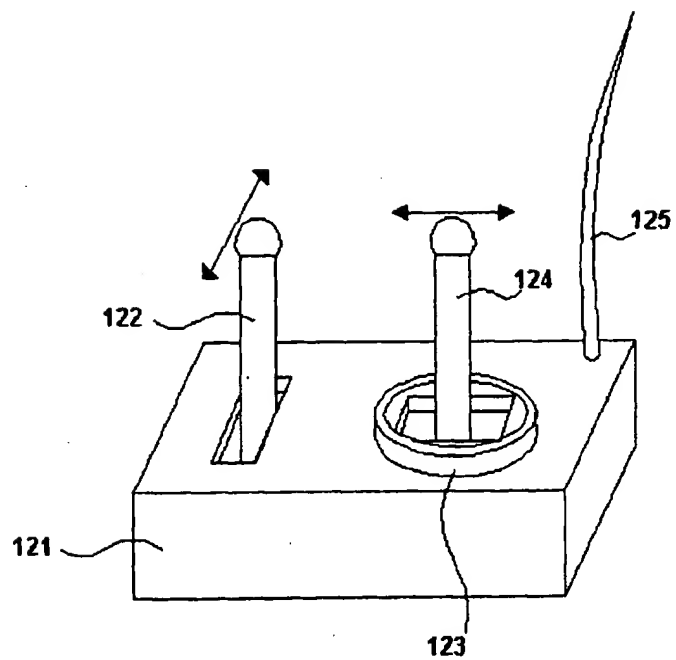


【 FIG. 12】



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【 FIG. 13】



INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR00/00650

A. CLASSIFICATION OF SUBJECT MATTER**IPC7 A63H 17/39**

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7 A63H

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

KR, IPC as above

JP, IPC as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US, 4902260 A(Bando co) February 20, 1990(20. 2. 1990) see the whole document	1-7
A	US, 5334075 A(Tomy co) August 2, 1994(2. 8. 1994) see the whole document	1-7
A	JP, 2-252484 A(Kobayashi) October 11, 1990(11. 10. 1990)(Family None) see the whole document	1-7
A	GB, 2187650 A(Kennedy) September 16, 1987(16. 9. 1987)(Family None) see the whole document	1-7

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

* Special categories of cited documents:

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Date of the actual completion of the international search

06 OCTOBER 2000 (06.10.2000)

Date of mailing of the international search report

10 OCTOBER 2000 (10.10.2000)

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/KR00/00650

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US-A-4902260	20-02-90	KR-A-89-14143	
US-A-5334075	02-08-94	GB-A-2258822	24-02-93